CLAIMS

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1. A coated optical lens including

a lens element; and

a coating on a surface of the lens element exhibiting a substantially balanced reflectance from the centre to a radius proximate the edge of the lens element.

2. A coated optical lens according to claim 1 wherein the lens element includes a surface of high curvature upon which the balanced reflectance coating is deposited.

3. A coated optical lens according to claim 2 wherein the lens element is of generally ovaline shape and is located on the surface of a sphere whose radius of curvature corresponds to 11 D or above, a toroid where the horizontal radius of curvature corresponds to 11 D or above, or a surface where the radius of curvature changes across at least one section of the lens aperture.

4. A coated optical lens according to claim 1 wherein the coating additionally functions as an anti-reflective coating.

5. A coated optical lens according to claim 4 wherein the coating exhibits a substantially low photopic reflectance in the red to infrared wavelength range of approximately 620 to 880nm.

6. A coated optical lens according to claim 5 wherein the substantially low photopic reflectance is less than approximately 3%.

7. A coated optical lens according to claim 6 wherein the coating is a multicoloured, anti-reflective coating.

8. A coated optical lens according to claim 7 wherein the coating exhibits a reflected colour difference (ΔE) from the centre to a radius of approximately 20 mm on the lens surface of greater than approximately 11 CMC colour difference

units, the colour difference being balanced by a complementary reduction in luminous intensity.

9. A coated optical lens according to claim 8 wherein the coating exhibits a reflected colour difference (ΔE) from the centre to a radius of approximately 20 mm on the lens surface of from approximately 11 to 20 CMC colour difference units.

10. A coated optical lens according to claim 6 wherein the coating exhibits a substantially uniform appearance from the centre to a radius proximate the edge of the lens element.

11. A coated optical lens according to claim 10 wherein, in use, the coating exhibits a reflected colour difference from the centre to a radius of approximately 20 mm on the lens surface of less than approximately 11 CMC colour difference units or less.

12. A coated optical lens according to claim 1 wherein the coating additionally functions as a reflective or mirror coating.

13. A coated optical lens according to claim 12 wherein the coating exhibits a substantially constant photopic reflectance in the red to infrared wavelength range of approximately 620 to 880nm.

14. A coated optical lens according to claim 13 wherein the coating exhibits a substantially uniform appearance from the centre to a radius proximate the edge of the lens element.

15. A coated optical lens according to claim 14 wherein, in use, the coating exhibits a reflected colour difference from the centre to a radius of approximately 20 mm on the lens surface of less than approximately 11 CMC colour difference units.

16. A coated optical lens according to claim 1 which coating includes a plurality

of layers, the thickness and/or number of which are selected to provide a substantially balanced reflectance in response to visual effects generated by variations in thickness of the coating.

17. A coated optical lens according to claim 16 including a plurality of layers of differing refractive index wherein the thickness and/or number of the respective layers are selected to balance the variation of any combination of reflectance lightness, hue and chroma.

18. A coated optical lens according to claim 17 where the layers of differing refractive index are formed from a dielectric material selected from one or more of Al_2O_3, $BaTiO_3$, Bi_2O_3, B_2O_3, CeO_2, Cr_2O_3, Ga_2O_3, GeO_2, Fe_2O_3, HfO_2, In_2O_3, Indium-tin oxide, La_2O_3, MgO, Nd_2O_3, Nb_2O_5, Pr_2O_3, Sb_2O_3, Sc_2O_3, SiO, SiO_2, SnO_2, Ta_2O_5, TiO, TiO_2, TiO_3, WO_3, Y_2O_3, Yb_2O_3, ZnO, ZrO_2, AlF_3, BaF_2, CaF_2, CdF_2, CeF_3, HfF_4, LaF_3, LiF, MgF_2, NaF, Na_3AlF_6, $Na_5Al_3Fl_{14}$, NdF_3, PbF_2, PrF_3, SrF_2, ThF_4, ZrF_4, Si_3N_4, AlN, diamond-like carbon, polymeric dielectric materials or doped dielectric materials.

19. A coated optical lens according to claim 18 wherein the lower index layers include a silica (SiO_2) or magnesium fluoride (MgF_2) material.

20. A coated optical lens according to claim 19 wherein the higher refractive index layer(s) exhibit a refractive index of approximately 2.0 or greater.

21. A coated optical lens according to claim 20 wherein the higher refractive index layer(s) include a titanium oxide (TiO_2) layer or a combination of titanium oxide (TiO_2) and praseodymium oxide (Pr_2O_3).

22. A coated optical lens according to claim 21 including four to six alternating higher and lower refractive index layers of silica (SiO_2) and a titanium oxide (TiO_2) layer or a combination of titanium oxide (TiO_2) and praseodymium oxide (Pr_2O_3).

23. A coated optical lens according to claim 16 wherein the coating is formed of a plurality of dielectric and metallic layers wherein the thickness and/or number of

the respective layers are selected to balance the variation of any combination of reflected lightness, hue and chroma.

24. A coated optical lens according to claim 23 wherein the dielectric layer(s) is formed from a dielectric material selected from one or more of Al_2O_3, $BaTiO_3$, Bi_2O_3, B_2O_3, CeO_2, Cr_2O_3, Ga_2O_3, GeO_2, Fe_2O_3, HfO_2, In_2O_3, Indium-tin oxide, La_2O_3, MgO, Nd_2O_3, Nb_2O_5, Pr_2O_3, Sb_2O_3, Sc_2O_3, SiO, SiO_2, SnO_2, Ta_2O_5, TiO, TiO_2, TiO_3, WO_3, Y_2O_3, Yb_2O_3, ZnO, ZrO_2, AlF_3, BaF_2, CaF_2, CdF_2, CeF_3, HfF_4, LaF_3, LiF, MgF_2, NaF, Na_3AlF_6, $Na_5Al_3Fl_{14}$, NdF_3, PbF_2, PrF_3, SrF_2, ThF_4, ZrF_4, Si_3N_4, AlN, or diamond-like carbon, polymeric dielectric materials or doped dielectric materials; and

the metallic layer(s) is formed from a metallic material selected from the metals, metal oxides or metal nitrides of one or more of Aluminium (Al), Chromium (Cr), Niobium (Nb), Nickel (Ni), Palladium (Pd), Tin (Sn), Tantalum (Ta), Titanium (Ti), Tungsten (W), or Zirconium (Zr).

25. A coated optical lens according to claim 23, wherein the coating is a light absorbing asymmetric reflectance coating such that from the wearer's side of the lens element the coating is anti-reflective.

26. A multi-coated optical lens including

a lens element,

a coating on a surface of the lens element exhibiting a substantially balanced reflectance from the centre to a radius proximate the edge of the lens element; and

one or more secondary coatings which provide a desirable optical and/or chemical and/or mechanical property to the optical article.

27. A multi-coated optical lens according to claim 26 wherein the secondary coating(s) overlays or underlays the balanced reflectance coating or is applied to a second surface of the lens element.

28. A multi-coated optical lens according to claim 26 wherein the secondary coating(s) is selected from one or more of an anti-reflective, abrasion-resistant, impact-resistant or hydrophobic coating.

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29. A multi-coated optical lens including

a lens element;

a first coating on the front surface of the lens element; and

a secondary coating on the back surface of the lens element; the first and second coatings in combination exhibiting a substantially balanced reflectance from the centre to a radius proximate the edge of the lens element.

30. A multi-coated optical lens according to Claim 29, wherein the secondary coating functions to reduce optical aberrations generated by the first coating.

31. A multi-coated optical lens according to Claim 30, wherein the secondary coating exhibits a difference in reflected brightness or hue relative to the first coating.

32. A multi-coated optical lens according to Claim 30, wherein the secondary coating exhibits a reflectance peak which is spectrally displaced with respect to a reflectance peak of the first coating.

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33. A method for preparing a coated optical lens, which method includes providing

a lens element; and

a coating exhibiting a substantially balanced reflectance from the centre to a radius proximate the edge of the lens element; and

depositing the coating on a surface of the lens element.

34. A method according to claim 33 wherein the lens element includes a surface of high curvature upon which the balanced reflectance coating is deposited.

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35. A method according to claim 33 which method further includes providing

a lens element,

a high refractive index material, and

a low refractive index material;

depositing overlapping layers of high and low refractive index material on a surface of the lens element, wherein the thickness and/or number of the respective layers are selected to balance the variation of any combination of reflected lightness, hue and chroma.

36. A method according to claim 35 wherein the high and low refractive index materials, titanium oxide (TiO_2) or praseodymium oxide/titanium dioxide (Pr_2O_3/TiO_2) and silica (SiO_2) respectively are deposited as alternating layers.

37. A method according to claim 36 wherein the balanced reflectance coating further provides an anti-reflective or a mirror effect.

38. A method according to claim 33, which method further includes providing

a lens element;

a dielectric material selected from one or more of Al_2O_3, $BaTiO_3$, Bi_2O_3, B_2O_3, CeO_2, Cr_2O_3, Ga_2O_3, GeO_2, Fe_2O_3, HfO_2, In_2O_3, Indium-tin oxide, La_2O_3, MgO, Nd_2O_3, Nb_2O_5, Pr_2O_3, Sb_2O_3, Sc_2O_3, SiO, SiO_2, SnO_2, Ta_2O_5, TiO, TiO_2, TiO_3, WO_3, Y_2O_3, Yb_2O_3, ZnO, ZrO_2, AlF_3, BaF_2, CaF_2, CdF_2, CeF_3, HfF_4, LaF_3, LiF, MgF_2, NaF, Na_3AlF_6, $Na_5Al_3Fl_{14}$, NdF_3, PbF_2, PrF_3, SrF_2, ThF_4, ZrF_4, Si_3N_4, AlN, diamond-like carbon, polymeric dielectric materials or doped dielectric materials; and

a metallic material selected from the metals, metal oxides or nitrides of one or more of Aluminium (Al), Chromium (Cr), Niobium (Nb), Nickel (Ni), Palladium (Pd), Tin (Sn), Tantalum (Ta), Titanium (Ti), Tungsten (W) or Zirconium (Zr)

depositing overlapping layers of dielectric and metallic material on a surface of the optical lens element, wherein the number and/or thickness of the respective layers are selected to balance the variation of any combination of reflected lightness, hue and chroma.

39. A method according to claim 38 wherein
the dielectric material is magnesium fluoride (MgF_2) or silica (SiO_2); and
the metallic material is Niobium (Nb) or Chromium (Cr).

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